

ITEMS OF INTEREST.

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Editorial.

CAUSE OF CARIES.

Dr. George Watt, editor of the *Ohio State Journal of Dental Science*, in his January issue, gives us quite an exhaustive treatise on caries of the teeth. He endeavors to show that it is not caused by inflammation, as asserted by the more ancient authorities, nor by living germs eating into the substance of the teeth, as taught by some modern theorists. He contends that it is by the chemical action of acids, predisposed by physiological or pathological conditions.

Dr. Watt is such a thorough and original thinker and investigator that anything he says should be received with consideration and studied with carefulness, especially upon a subject of such importance.

He wishes it distinctly understood that by the acid theory is not meant that the mere quiescent (quiet, formed) acid, as found in the saliva, is sufficient to produce decay. The general state of the mouth may be alkaline, and yet locally, in the interstices, or cracks, or pits of the teeth, there may be nascent (forming) acid, producing the tooth's destruction, especially in case of imperfect tooth-formation. In fact, he insists that an alkaline state of the buccal fluids is a usual precursor of white decay—the variety the most rapid and disastrous in its course—because this alkalinity is due to ammonia, which is a compound of hydrogen and nitrogen, its presence resulting in the formation of the most destructive acid (nitric) ever found in contact with the teeth. To get rid of this predisposition to the formation of nitric acid he recommends a vegetable or fruit-acid treatment. This nitric acid is always found in the putrefaction of azotized substances, such as meat; or whenever the vitality of the tissues is so low as not to be able to resist chemical action, and is formed when, in this process, ammonia (also the result of putrefaction) is exposed to the action of oxygen, either nascent or quiescent. The nitrogen of the ammonia is burned—

oxidized—into nitric acid, and its hydrogen into water. Sound teeth in the presence of a decided acidity of the mouth, he thinks, indicates “normal carbonic acid, without the presence of ammonia.” Even in case the acidity of the saliva is sufficient to act on the teeth, he does not believe it capable of producing caries. The reason a tooth pickled in hydrochloric acid does not develop decay is because the acid is quiescent, and the tooth is not in its physiological condition. “Even in the mouth, neither malic or fruit acid, nor butyric or the acid from putrefied meat, will produce caries.”

After defending his acid theory against the objections of its opponents, he considers the germ theory. This is that caries is absolutely dependent on the presence and proliferation of minute living organisms—that these attack the organic material of the tooth, and, feeding upon it, create an acid which removes the lime salts. Dr. Watt’s objection to this theory is that, according to his investigations, the statement is wrong. Instead of organic matter being the first attacked, much of it is often found in the cavity of decay, and so little disturbed as to distinctly show its organic structure. Then, too, he thinks the whole phenomenon of decay proves that these organisms are the result of the acidity, and not the acidity the result of the organisms.

In conclusion he says:

“Many are puzzled to know why caries is found in definite spots, if the chemical theory is the true one. Let it be borne in mind that the acid immediately causing the decay is always nascent when doing its work. Many reasons explain why it is generated, or liberated at particular points. Then the microscope reveals places in both enamel and dentine imperfect on account of imperfect organization. These points yield to chemical action much more readily than normal structure; and this is one reason of the definite position of caries. And now suppose the exciting agent has, through a defective spot, got within the enamel, it acts on the dentine, and is not readily washed away by the fluids of the mouth, or even by the brush. Take, for illustration, a case of white decay. The exciting agent is here able to break down all tooth issue. It acts on the inorganic a little more readily than on the organic. It does not form with tooth material, as highly soluble compounds, as does the agent, or agents, in causing chemical abrasion. The destroyed tissue will, in part, remain within the cavity of decay, but most of it can be wiped away with lint, or washed away by a stream of tepid water. Not nearly so much of the decayed material can be thus removed from a cavity formed by the colorless, or brown variety of caries.

“Now, for the present, assume that white decay is immediately caused by nitric acid, and that this acid is formed by the oxidation of ammonia. As ammonia is composed of nitrogen and hydrogen, its oxida-

tion results in nitric acid and water. Liebig and other authorities state that it is always thus oxidized in the presence of free oxygen. And if it was in Liebig's day, it is now. Remember, too, that ammonia always results from the putrefaction of nitrogenous organic compounds. Suppose an atom of nitric acid has got through the enamel—not through the hole that Mayr's bug goes in at—but through a defective spot. It acts on the dentine—faster on the lime than on the gelatin. A thin layer of the lime-salts is dissolved, and of course, a thin layer of organic matter is left. By putrefaction it gives ammonia, to be oxidized into nitric acid, to dissolve more lime, and expose more organic matter, to putrefy and give more ammonia, to be oxidized into more nitric acid, to dissolve more lime-salts,—and thus, on and on, till the pulp cavity is reached. Such is white decay.

“We might illustrate the most common, and the black decays in a similar way.”

VULCANIZING RUBBER.

Considerable prominence has been given in many dental journals to an article on vulcanizing rubber by a European named Gustav Hahn. We think the experience of most dentists will antagonize the “laws” laid down by this theorist.

His first proposition is that the porosity of rubber, sometimes developed in its vulcanization, is due to insufficient packing. Our experience is that, in vulcanizing, a piece of rubber simply dropped in soft plaster, or even left upon the top of the flask, is no more liable to be porous than when thoroughly packed.

The rule is that the greater porosity will be found where there is the greater thickness of rubber, without reference to the degree of packing.

After giving what he calls the physical laws governing the proper vulcanizing of rubber, Mr. Hahn thus covers his field:

“If we summarize the results of the above laws, we find that in order to produce a good rubber plate, we need a dense steam, any part of which must not escape during vulcanizing. If any part of steam escapes, the remainder becomes rarified, and the result is a rubber plate, which is porous.”

Mr. Hahn's observations and ours again conflict. If the heat is kept at an even and sufficient degree for vulcanizing then, notwithstanding some of the steam escapes, the rubber will be properly vulcanized.

Again, he says: “The same takes place when there is not sufficient water, so that the steam, losing its density, some of it becoming overheated, becomes rarified. In both cases pores are unavoidable.”

This is easily disproved by vulcanizing with only a little water in

the vulcanizer. With regard to the occasional complaints of sore and inflamed mouth, he comes to the conclusion that this is due to "badly vulcanized plates." We do not believe this has anything to do with it. Who does?

Mr. Hahn says, "When the vulcanizing is done it ought to be clear that the sudden change from extreme heat to cold would prove injurious to the work and material." Not in our hands. We have often carried our vulcanizer directly from the flame to ice water, or the running hydrant, without apparent injury, and we know of many others who do the same, although we believe the vulcanizer itself will be in a better condition to stand steam pressure if one does not thus suddenly cool it.

DR. MARSHALL H. WEBB.

Dr. Marshall H. Webb of Lancaster, a native of Chester Co., Pennsylvania, died January 1st, in the thirty-eighth year of his age, leaving a wife and four children. His untimely death was undoubtedly hastened by over-work, though cancer of the stomach was perhaps the predisposing cause. He graduated from the Philadelphia Dental College in the year 1867 with ordinary honors and then did mechanical work for dentists, and made a specialty of extracting. That which acted most powerfully as stimulus to induce him to devote himself to operating was witnessing at a meeting of the National Dental Association, extensive operations by Dr. Atkinson, of New York, and Dr. Huey, of this city. From that time on he worked faithfully and as is *well known* successfully at operating. As a universally successful operator he was probably at the head of the world. Others can do certain difficult lines of work; but none with as few failures as he had. As a benefactor and friend to the dental profession, his value cannot be overrated. To him is due the credit of developing the electric mallet to its present state of perfection.

Nobody could ask too much of him. To his own detriment he was ready to help others, and many times after a hard day's work, he would spend much time finishing operations, or repairing mallets sent him from all over the country, with little or no remuneration. From a very humble position and with inherent diffidence in the face of difficulties which would have disheartened many others, he attained an enviable standing in the profession. Through his writings and by his operations his name is known by the profession throughout the world. In Lancaster his practice was large and lucrative; but his numerous calls from abroad, to which he generally responded, resulted in loss at home. His distinguishing traits were thoroughness and indomitable perseverance and extreme kindness with conscientiousness. Scarcely

a week passed that some dentist of this country or of other parts of the world, was not standing at his chair, to which all were welcomed.

During his illness he wrote and dictated a book, "Notes on Operative Dentistry," now being published by the S. S. White Dental Manufacturing Co. His career was a short but glorious one, and his name will be remembered and honored, by those who knew him.

ARE THERE TOO MANY DENTISTS ?

In 1840 there were in the United States one dentist to every 15,000 inhabitants. In 1850 there were one to every 6,000. There has been a constant increase, till now there are about one to every 4,000. If these were properly distributed there could be no question of excess. But they are not. Wide sections of the country are almost destitute of them, in other sections there are not less than one to each thousand. But we must remember that there are large classes of people among whom a dentist would be an anomaly, or at best but a specialist for extracting their teeth ; while in some communities the normal condition of the teeth are attended to with as much care as the warmth of the feet and covering of the head.

Dentists are like missionaries, they create their demand. The main question of their support is their efficiency. Their number can be doubled without crowding, if they can educate the people among whom they practice to a proper appreciation of their services. Then, again, it must be remembered that though there are nominally 12,000 dentist in the United States, there are not half this number that by their knowledge or their skill are entitled to the name. There are not too many good dentists. There is plenty of room in almost every community for first-class workmen, especially those who can not only do good work on poor teeth, but can professionally superintend the regulation and preservation of good teeth, and influence the community to appreciate their services. The more enlightened a community, the more dentists it will employ ; not because there are more decayed teeth to fill, and more artificial dentures to insert, but because the loss of a tooth will be looked upon as a calamity, and attention to their preservation will be more universal. Some parents wisely pay their dentist and physician more as a yearly salary for superintending the health of their children than they would be willing to pay for their occasional treatment when diseased.

Thoughts from the Profession.

THE NEW DEPARTURE.

BY DR. J. R. PATRICK.

What Dr. Chase and his co-laborers wish to prove is, that gold, from its power to resist chemical action, is to be considered the worst material for filling teeth, because it is one of the most negative of metals,—that is, that the dentos is dissolved and goes over to the negative metal; but by his own confession his instruments do not indicate that dentos is a positive element in his oral battery. Dr. W. C. Barrett, of Buffalo, New York, in his very able review of the so-called “New Departure,” very successfully quotes Dr. Palmer against himself. In a paper read before the State Dental Society of New York, in 1874, Dr. Palmer says: “A porous tooth containing an amalgam plug has in it the elements of a minute but intense *battery* capable of decomposing not only the plug but the tooth around it.” This early statement of Dr. Palmer proposes an impossibility, for gold, silver, platinum and tin, fused together and then reduced to filings and afterwards amalgamated with 60 per cent. of mercury, *would not* and *could not* polarize to form an electric combination, much less a “battery.” The molecules of each separate metal would be positive and negative to each other in such a confusion of infinite quantities that they would neutralize each other’s action. I know of no means of forming an electric combination in the mouth except by filling a superior tooth with a zinc amalgam, and an inferior opposite one with silver amalgam, so that they would come in contact. Then I admit that a circuit would be formed through the moist tissues of the mouth from the zinc to the silver, and in case of an acid condition of the fluids of the mouth, electric excitement would take place every time the two metals came in contact. If the fluids were neutral, electric excitement would take place feebly.

That electric currents should be generated in the mouth, and that when present they should be destructive of bony tissue, so far from being true from a scientific point of view, is not, I think, even theoretically possible, for the following reasons:

1st. The sense of taste is an extremely delicate test of an electric current; signals may be tested which even the most delicate galvanometer will fail to detect.

2d. Very strong currents of electricity have been used daily for months and years as a therapeutic agent in cases of paralysis, and it

is in constant use as a stimulant to tetanize dormant muscle without being in the least destructive to bony tissue.

It is not electricity that does the mischief; it is defective filling with gold and a change of molecules in other materials used for filling teeth, and this takes place when no current could be perceptible. Diffused electricity may take place on the decomposition of any substance, but it must be remembered that in this electricity is the result, and not the cause, of molecular change.

In the June (1877) number of the *Missouri Dental Journal*, on page 223, Dr. Chase sums up the results of his experiments and observations, and embodies them in the following sentences:

"Gold is not oxidizable in the mouth, and in itself may be said to be permanent, but the tooth suffers more from that fact. *It is the tooth-substance* that does not last; the metals of which plugs are made *last* long enough. Their slow surface chemical disintegration is *desirable* in an acid condition of the mouth. A plug that will not do this is a greater enemy to dentos than one that will." These sentences need no comment.

In the *Journal* of July 15, of the same year, the doctor gives freely the results of his experiments in dental alloys, and publishes three formulas. The first formula contains equal parts of gold, silver and tin, amalgamated with 80 per cent. of mercury, or, if 20 parts of tin filings are added, 60 per cent., which makes $146\frac{2}{3}$ parts of tin, silver and mercury, and $33\frac{1}{3}$ parts of gold. This amalgam, while it contains so small a proportion of gold, is far richer in that metal than any alloy in the market, for where platinum is used it only takes the place of gold or divides the honors with that metal.

Now, why use gold at all? If gold is incompatible with tooth substance, so is platinum. Why use these expensive metals in such connection? Are there no fears that this seductive and dangerous gold will corrupt the virtues of the other four metals? Is it not a short-sighted liberality to use it in such connection when it is useless? But if it be dangerous to the integrity of tooth-substance, is it not culpable?

When Thomas Fletcher produced the platinum and gold alloy, it was an improvement on Dr. Townsend's amalgam of tin and silver, as much as Dr. Townsend's amalgam was an improvement on the zinc and tin amalgams in use forty years ago; and I can assure you it was no spasmodic fit of emotional generosity that induced Fletcher to add the gold and platinum to the silver and tin of Townsend, and smelt them together, producing a more intimate connection of their particles than could have been obtained in the filings of the separate metals. The wide difference of expansion and contraction of the several metals under terminal influence is to a trifling extent compensated thereby.

This was his object, and this is why test tubes were introduced. The elements that are constantly present in the body, that unite directly with silver, tin and mercury, were no consideration with Thomas Fletcher, and, as far as this controversy has gone, I am not aware that they have been introduced by any one.

THE POSITION OF THE DENTIST AT THE CHAIR.

BY LOUIS OTTOFY, D.D.S., GRAND FORKS, D. T.

Recently I observed an editorial upon this subject in the *ITEMS OF INTEREST*; being ambi-dextrous, my remarks will probably not coincide with the opinions of most practitioners. When operating on the teeth of the right side of the lower jaw, be it either filling, extracting, or treating, my position is on the left side of the chair, most usually nearer to the back than the side of the chair, with the head usually almost above that of the patient. When operating on the left side of the lower jaw, my position is on the right side of the chair as near to the back of it as possible.

In operations on the lower jaw I can see no reason for the operator inhaling the breath of the patient. When the upper and anterior teeth are in question, the position usually should be directly back of the patient, sufficiently tipping the chair to permit the operator to keep his head above that of the patient, nevertheless permitting the mouth of the patient to be directed forward, sideward or downward, as the case may require, sufficiently to permit the breath to be exhaled in a direction which will not cause it to be inhaled by the operator. It is generally when operating on the upper and posterior teeth that we sometimes find difficulty in gaining a position by which to prevent the inhalation of air unfit for breathing. In most instances of this kind the head can be tipped to one side sufficiently to escape that inconvenience. Of course, in my case it is probably easier than with some operators, as I stand on either side of the chair and thus entirely escape that trouble. Formerly I was troubled a good deal by carelessness in regard to this matter; forgetting my position, I sometimes would inhale the patient's breath for such a long time that I had to cease and turn away to fill the lungs with more wholesome material; by studying my positions I have overcome this difficulty. If we remember the injuriousness of vitiated air, especially that which issues from the mouths of some patients, carrying with it the germs of disease, or at least the results of putrefaction, we will readily admit the importance of the correct position in dental operations.

The only difficulty that I yet find, occasionally, is in operating on the upper molars, and sometimes the bicuspid also; in these instances, especially on posterior proximal cavities, I cannot prevent it.

THE DENTIST'S RESPONSIBILITIES.

Extracts from an Address by Dr. J. Leslie to the Graduating Class of the Ohio Dental College, March 1, 1882.

Not only must you be honest and faithful operators, doing the best you can for your patients but you must read and study the standard works of your profession. When you locate endeavor to make the acquaintance of some one who may have on hand a stock of dental literature. What has been done and accomplished by others may be a sort of *Materia Medica* in your practice; and let me say there are thousands of good hints in the records of dental practice. The first dental magazine ever issued was one of the first assistants of our *Alma Mater*, and was issued and edited by the noble man from which the college sprang—Dr. James Taylor. It was the first evangel of the profession to the world; and during all these years, it has appeared every month, and to-day lives and is edited by Prof. Jonathan Taft, under the old name of the *Dental Register*. But you should be subscribers for several monthly periodicals so you may keep posted about the improvements of the day. To prolong the use of the natural teeth is your relative work among men; but I can not conclude without reminding you that the chief object of your life is not merely to relieve pain and enable your friends to speak clearly, and chew their food comfortably. The time will come, notwithstanding all our skill, when the grinders will cease, and they may be few. There is a *thinking vita propria*—a life from without that gives vitality to every organ; and it is to-day the verdict, after years of most searching and brilliant experiments by Tyndall and others, that this life is not of spontaneous generation, but comes from the outside. Dana and Virchow and hosts of eminent scientists confirm the same old conviction. Virchow, at the Berlin convention, in opposition to Hackel and all his school, affirms that man is something more than mere “Carbon, Oxygen, Hydrogen, & Co. ;” and Carlisle says that the “Gospel of Dirt” can’t satisfy the nobler parts of our nature; and, after all his deep study displayed in his admirable essays on men and things, accompanied with a good deal of grumbling, he declares the chief end of man “Is to glorify God and enjoy him forever.” You may discover new facts, but no discovery can ever set aside the great historical facts of Moses as a divine law giver, with or without his mistakes, and Jesus the Nazarene, the Christ of God, whose resurrection from the dead is the great demonstration for the continuance of this life beyond. I point you to his life among men, and his instructions, as the most perfect and the loftiest morality ever taught; and let us never forget that while he healed all diseases the preparation of heroic and choice spirits and their communion in that life to come was and is the end of all he did and said.

OBITUARY.

MARSHALL H. WEBB, D.D.S.

At a meeting of the Odontological Society of Pennsylvania, held January 6th, 1883, the following was adopted as a tribute to the memory of a late fellow member :

" We desire to express, as far as words can, our deep sorrow for the death of Marshall H. Webb, D.D.S., and our recognition that with him we have lost not only a most worthy member but a sympathizing friend. With deep regret we realize that we shall never again listen to his gentle voice nor feel the force of his personal magnetism.

" Death never enters into any family, a group of friends, or an association of any kind, but it trails a shadow to darken some life, to sadden some heart and render obscure the pathway of the future.

" In the death of our colleague and friend we recognize the full force of this, for he not only leaves a sorrowing family but his departure involves a large circle which has felt his influence, and will continue to feel it far into the future.

" Dr. Webb was no ordinary man. He was essentially a leader, not in the sense of arrogant assumption ; but as one who took his place through earnest toil, unselfish devotion and conscientious ambition. He labored that others might grow. He mined that the professional fires might burn all the more brilliantly and though his day was short, every hour was full, and the record thereof may be filed away in the hearts of his friends with the indorsement, ' Well done, good and faithful servant.'

" The hour of death is not the hour for critical judgment. Dr. Webb's work belongs to his profession. The ideal that he labored for was his ever constant inspiration. To accomplish it no sacrifice was too great, no labor too exhausting. No life can be to valueless that aims at excellence ; but how much more worthy of emulation is the harvest when gathered with the golden grain ripened to perfection ? In his special work our friend reached an acme of skill beyond which he had no superiors. Perhaps he may not have always worked wisely ; it may be that his unswerving devotion to his ideal brought him to suffering and death ; but if so, he leaves a monument in his example that will be an honor to his name and a glory to his profession.

" We wait, watch and linger by our dead. Their memory hallows our lives, their deeds are graven on sorrowing hearts ; but as we linger, the funeral knell reminds us again that change is the law of the universe and that, in the translation of another : We inherit the work of a life, which should be the ever present incentive abiding with us forever.

" *Resolved*, That a copy of the foregoing be transmitted to the

family of the deceased with the assurances of our deep sympathy with them in their affliction, and also forwarded to the dental journals for publication."

Scientific.

HUMAN PHYSIOLOGY.

BY L. ASHLEY FAUGHT, D.D.S.

Formerly Lecturer on Physiology in the Philadelphia Dental College.

[Entered according to act of Congress, in the year 1882 by L. Ashley Faught, D.D.S. in the Office of the Librarian of Congress at Washington.]

(CONTINUED FROM JANUARY.)

ALIMENTATION.

Having laid the foundation of nutrition, by the consideration of proximate principles; one may turn to the superstructure,—alimentation. Aliments may be defined as solid, liquid, and gaseous articles of nourishment taken into the systems of organized beings. I have previously stated that life depends upon a constant flow of pabulum, and varies in its condition as this current of material is rapid or sluggish. It is evident, therefore, that any stoppage of it would be quickly followed by a cessation of living phenomena. Nature has provided a guard against such an occurrence in that known as appetite,—the gentle and pleasant desire for food. Numerous circumstances modify the appetite, including those acting upon its daily recurrence and those influencing the character of the desired aliment. The sight, smell, or thought of a savory substance will often give rise to an appetite for it. By force of habit, appetite is felt by most individuals three times daily, while in those accustomed to but two meals, it recurs but twice. In the infant, where by reason of development the demand for food is great, appetite occurs six or seven times a day, and should be gratified. Exercise, occupation, habit, the condition of the system, and especially climate, will vary the kind of aliment desired. Residents in a cold climate have an instinctive desire for animal food; while the people, whose lot is cast under the burning rays of the sun, partake of such with aversion, seeking a vegetable diet, especially acid fruits. In the Temperate zone the change of seasons produces similar effects. Disease also greatly modifies it,—at times creating an abnormal appetite for an enormous quantity of food, or for things of a most disgusting nature.

When the desire for food is ungratified for an unusual length of time, hunger ensues, accompanied by unpleasant symptoms. If abstinence is still prolonged, pain in the head and in the stomach, with general systemic derangement gradually ushers in all the horrors

of starvation. While the first and general indication of hunger may refer us to the stomach, the after symptoms involve derangement of the entire body. The individual globules even, suffer pangs when food is withheld from the system. This has been proven by experiments in patients suffering from gastric fistula. In such cases, relief is not obtained while food is passed in at the mouth and out at the opening in the stomach, but only when the fistula is closed and digestion has progressed to the absorption of the nutrient material.

When the unpleasant desire on the part of the system is for liquids, it is denominated thirst. The sense of thirst is generally referred to the mouth and fauces, but its real seat, as in hunger, is in the entire system, and can only be relieved by the absorption of water, and not by its mere presence in the mouth. This has been demonstrated in cases of gunshot wounds of the neck by allowing water to flow in at the mouth and out at the opening. However, water held in the mouth, will, by reason of minute absorption through its mucous membrane, have a palliative effect. Great care should be taken in drinking very cold water to quench thirst, especially when the system is in a heated condition. Serious disturbance, and even death, may result through the effect produced through the pneumogastric nerve. Thirst may be produced by fright, severe exercise, disease, copious bleeding or any draining of the juices of the body where there is an activity of the mucous membrane.

Life may be maintained during deprivation of food and water, about sixteen days; when water alone is taken, for about thirty days. These statements are not exact, as they admit of great modification, according to the age, health, habits and obesity of the person.

Plants obtain their food from the soil of their natural habitat, but animals must search after and secure their sustenance by the means afforded them by nature. The spider, for instance, procures its supply by the artifice of its web; the ant-lion by the pit it digs; while other animals lie in wait and by fraud and deceit, or by main force secure their food. Man by combining all these means, draws his subsistence from the animal and vegetable world.

Although the value of food is not entirely dependent upon its composition, a classification based upon such is advantageous. They are divided into the nitrogenized, or albuminous compounds; the non-nitrogenized, or starchy and fatty matters; and the inorganic substances. All these have been given and considered previously. These divisions are again arbitrarily divided into the histeo-genetic, and the calorifacient. The histeo-genetic, being nitrogenized, build up the organism;—the calorifacient, being non-nitrogenized, produce animal heat. This division aids study, but no such distinct line of separation

exists, for under certain circumstances they are interchangeable, and a calorifacient may do the work of a histeo-genetic, or vice versa.

A knowledge of the composition of different article of food, is very important. To know what articles of diet is, under certain circumstances, injurious or beneficial, depends upon a thorough acquaintance with its ingredients.

Milk is the typical form of an aliment, as it contains the four things necessary to nutrition,—water, fatty matter, sugar and salts. Human milk contains more sugar and water than that of the cow; this should be remembered in substituting one for the other. The milk of a goat approaches nearest to that of the human female. Milk also contains caseine. Although generally admitted to be beneficial as an article of diet, it is often objected to if taken at night, on account of its supposed indigestibility and consequent disturbance of sleep. Such injurious results are due to the improper time of its injestion. Milk should never be taken except at a period nearly three hours after a meal, if the good effect of it is to be fully experienced; and this fact is true even if nine o'clock at night be the hour, and the person retire at once, provided supper was eaten at six.

An important aliment is bread. The old maxim "bread is good, but bread and butter is better" is not without foundation in truth. Why? Bread contains all those materials which, under ordinary circumstances, enter into the tissues; while butter, when added, adds also the heat-producing quality. Bread, if improperly made, is injurious. A good quality of flour is an important item, and the whitest brands sold by dealers as the best, are far from being the most desirable. The process of bolting has removed many highly nutritious substances, which the darker quality possesses. The brown or "entire wheat" should frequently, if not always be found upon the table. The process of making good bread is as follows:—take a quantity of lukewarm water in proportion to the amount of bread desired and dissolve in it a little salt; then stir in as much flour as will completely absorb the water; no more nor less,—add a little brewer's yeast and set aside for a few hours in a moderately warm place to allow of raising. Knead, and after a second period of raising, bake at a temperature of 400° Fahr. The process of raising is important. It is a species of fermentation, in which carbonic acid is generated in all portions of the mass, being held in cells, formed by the flour and water, dividing the particles of wheat and thus contributing afterwards to easy digestion. The dough cells are hardened by baking, retaining the carbonic acid within them. It is evident therefore that the process of kneading should not be neglected, as it tends to more thoroughly incorporate the generated gas with the mass. The process of raising should be conducted at a temperature of 68° Fahr; as above or below this is

injurious to the quality of the bread, by either accelerating or retarding the fermentation. Bakers are in the habit of using alum for the purpose of whitening a cheap article of flour and aiding in the process of raising. Chemical test has proven bread made in this way to be detrimental to health, as alum is highly so to the system when taken either in large doses or in small ones often repeated.

Eggs are an important aliment. The white of the egg is pure albumen, and the yolk is highly nutritious. They should be eaten raw, and under no circumstances should they be eaten hard-boiled, and seldom fried.

Meats are nutritive, and in all their variety are of value. Boiled meats and especially fried are indigestible. The best mode of preparing flesh for the human stomach is by broiling and by roasting. Broiling is especially healthful. Meats broiled over a wood fire have a more pleasant flavor than when done over one made of coal.

Vegetables are important, as they supply much that cannot be obtained from an animal diet alone. Some influence the nervous system, as lettuce, celery, etc., and are particularly desirable in the treatment of nervous irritability.

Caseine, known in the form of cheese, is of value as it aids digestion. It is itself hard to be digested.

(TO BE CONTINUED.)

THE ENAMEL OF A TOOTH.

Though the enamel contains but four or five per cent. organic, or vitalized matter, this is so wisely distributed that it moulds and binds so closely the earthy portions—principally the phosphate and carbonate of lime—and cements them so strongly, that enamel is the hardest, and most enduring substance in the body. In fact, though all the bones of the skeleton last long after death, the teeth are almost indestructible. They are found measurably perfect thousands of years after the death of the body. There is only one bone—one of the smallest of the ear—which approaches them in these characteristics.

The enamel is generally termed a cap to the teeth; and yet if this irregularly thick covering were removed we would hardly recognize what was left as a tooth. It is thickest upon the grinding surfaces, and as it passes down over the neck of the tooth it terminates just under the coat of the cementum which comes up from the root. Some anatomists think this cementum extends over the whole surface of the enamel, giving it the fine, shining gloss generally seen on healthy enamel. And this notion is rather strengthened by the fact that the surface of enamel is much harder and more resistant to instruments and acids than its inner portions.

As inorganic as enamel appears from the great predominance of earthy materials, it has not only physical structure, but the microscopical evidence of vital formation and activity in its beautiful fibrous net-work, is of the most delicate and interesting character. The structure of its prisms is something like the honey-comb of the bees. The fine filaments of the enamel's cellular membrane answer to the hexagonal divisions of the comb. These enamel prisms have a general direction from the surface of the enamel through to the outward circumference, or periphery, of the dentine. They are somewhat curved or wavy, sometimes decussating, or crossing each other at acute angles. All this is to be seen much more plainly during the formative stage of the tooth than when, at maturity, its cellular membrane is filled and almost obliterated by earthy material. But as perfect as this filling-up becomes, this prismatic, columnal structure gives place between its prisms to a vital fluid which so nicely answers to nerve fibers that life is apparent throughout its substance, and vital sensation is communicated through these tubular interstices to the pulp. It may also be the seat of inflammation giving rise to acute sensitiveness which could not be the case if it were not a vital structure.

As these prisms of enamel were formed from within, outward, and as they do not become smaller as they progress, it follows that many of those in the outer portion must terminate before reaching the inner surface, resting on the dentine; in other words, that they are not all continuous through the whole thickness of the enamel.

Imperfectly formed enamel sometimes presents minute fissures which become the receptacles of foreign substances, or at least of liquids. These acidify and thus give rise to decay. There are sometimes smaller pockets in the substance of the enamel. Still larger fissures are produced by the imperfect foldings of enamel, especially in the grinding surfaces of the bicuspid and molars.

The evenness of the surface of enamel is often striated, or furrowed, showing an uneven development in its growth. Sometimes these are so deep as to make their posterior faces unsightly, and not unfrequently necessitating a narrow band of gold as a substitute for deficient or defective enamel. It is caused by the arrest of enamel growth at certain periods of infantile sickness, or perhaps from the sickness, or morbid appetite, or defective character of the food of the mother at times during utero-gestation. Similar defects in the deposit of enamel is often seen on the grinding edges of the incisors and cuspids, and especially of the lower teeth; but this is generally lost by abrasion in their use.

Miscellaneous.

WISHING AND WILLING; WHICH SHALL IT BE?

In a dreamy way, through a cloud of tobacco smoke, a dentist said to us the other day: "I wish I had a thousand dollars."

"Earn it, then," we replied; "and when you have it, keep it. Is that hard?"

"It would be easier," said he, "if some rich uncle would give it to me."

And thus this poor, shiftless dentist goes on from year to year, wishing for wealth, but barely living from hand to mouth; continually wishing for something to turn up which would give him a fortune without the trouble of earning it.

A thousand dollars! This would seem a large sum to that dentist were it all placed in his hands at one time. And yet more than twice this sum is given him during the year. What does he do with it? His necessary expenses take a thousand dollars; where does the rest go? At least five hundred is wasted. Both in our family expenses and our personal habits, often, more is spent on superfluous wants than necessary needs; and the more we have of these extravagant, enervating, dissipating habits, the more numerous will be our childish, foolish and useless wishing.

How many of us spend our lives wishing in vain for what we might easily have by willing; for if we truly will for a thing we shall put forth the energy necessary to obtain it, if it is within our reach. Merely wishing is to see it passing by while we are dreaming, or spending our time frivolously. We may wish in vain for friends, but friends are within our reach when we show ourselves friendly; we may wish in vain for the respect of the community, but this is easily had when we respect ourselves; we may wish in vain for a successful business, but this is for us, if we cherish it; we may wish in vain for a good bank account, but it is only to save our earnings.

But what does a strong will do?—That cigar! A will tosses it to oblivion, and with it its associate dissipating, expensive, offensive habits, which have barred out our best patrons and brought in only the most unprofitable. The billiard table with those other means and places for killing time and business and home have gone with the cigar. The very disposition for such things has gone; for a stronger, higher, worthier influence has taken its place. And now, with clean clothes, a sweet breath and a clear conscience there is an awakening into a new atmosphere, in which is found more refined, profitable and

elevating associations. By an indomitable will, dead weights have been thrown off, and you have aroused yourself from a negative, loose, wasteful life into one of positiveness, aggression and inspiration. Those leaks through which five hundred dollars a year went, are stopped and now another five hundred dollars comes pouring in from new patrons to complete the thousand dollars *wished* for. No, not *that* thousand dollars; for if that had been received by the wishing it would have only caused greater indolence and dissipation. You have *willed* yourself a thousand dollars, and it has become a heritage of wealth, material, moral and intellectual.

Now, do not waste the little inspiration the thought of this article gives you in mere lamentation over short-comings; simply wishing circumstances were not what they are, does not change them. Reformation is the only help. Wishing to be better is not sufficient; abandon what you know to be wrong, and what you know to be right do. Even wishing for the courage to do this will not suffice; straighten up and *act the part* of a courageous man. The very effort gives strength, and this infused strength accomplishes the purpose. Wishing you were industrious, and economical, and wise, and skilful, and popular, and rich, does not make you so; acting does. *This moment rise* from your lethargy, and, by a willing, which turns every muscle and faculty into a force, be filled with energy. Abandon extravagant, dissipating, offensive habits. Be no longer slovenly, listless and purposeless. Be trim and wide awake—definite in purpose, precise in execution and business-like in husbanding the results of your labor.

Then with the thousand dollars *willed* shall come all the elements of honor, happiness and success.

Of course, all wishings are not reprehensible. Some are natural, proper and suggestive. They are neither to be disregarded nor implicitly obeyed. Under the scrutiny and control of reason they give cheer to the emotions, inspiration to the mind and significance to the genius. It is the foolish, reasonless, enervating habitude of wishing which carries us astray. But if reason justifies the wish, and if it is immediately transformed into a will which produces energy, power, life,—then reason and passion, like a well-matched team of horses—well trained and spirited—will carry our wishes and us delightfully to mansions of pleasure and reward. Nothing so quickly dispels unwholesome reveries of idle wishing, as a determined purpose and a vigorous, absorbing activity.

We can be no better than our thoughts; for these are seeds planted by the mind in our hearts, where they are nourished by our desires and are matured to bring forth fruit in our actions, according to their character, whether they be good or whether they be evil.

SULPHUR SMOKE AS A DISINFECTANT.

BY GEORGE WATT, M.D., D.D.S., IN OHIO STATE JOURNAL OF DENTAL SCIENCE.

When asked for the best disinfectant, and we recommend sulphur smoke, the inquirer appears disgusted; yet, simple and cheap as the re-agent may appear, it destroys the poison of small-pox, cattle-plague, chicken and hog cholera—really it is almost difficult to tell what it will not decompose. This is all the more evident when we think that sulphur smoke is simply sulphurous acid in a gaseous form. Its gaseous state enables it to penetrate and thus reach where ordinary disinfectants cannot be readily applied. Then it acts in two ways; as an acid, it takes alkalies and alkaloids, forming neutral salts, ordinarily called sulphites. And all are familiar with the power of sulphites to offset or prevent fermentation or putrefaction, so that if neutralizing the alkaline matters is not sufficient, the action is carried farther by the sulphites. This explains but half its power, if even that much. The sulphur is not yet fully oxidized, and the sulphurous acid has, therefore, a very strong affinity for oxygen, and in receiving an additional equivalent of it, it is changed to sulphuric acid. Taking oxygen from very many compounds is all that is necessary to decompose or destroy them. But if further action is necessary, the sulphuric acid is itself one of the most powerful re-agents known to chemistry.

Now we hope our readers will all clearly understand how this agent acts as a disinfectant, if not previously familiar with the subject. A few words as to ready methods of applying it may not be amiss. The common massive brimstone is as good for this purpose as the sublimed sulphur. A pound of it is enough for an ordinary room of ten or twelve hundred cubic feet. A flat bottom is convenient for the vessel to contain the fire. A little water may be put into it for safety. A common pot of iron or earthenware may be set in the water, a few coals may be placed in it, and the sulphur may be dropped on the coals. The party doing the work should then retire and close the door, and leave matters for six to ten hours, after which the enclosure should be thoroughly ventilated. Stables, cattle sheds, poultry houses, etc., are readily disinfected by this agent, and with an expense merely nominal. It should be remembered that sulphur smoke bleaches as well as disinfects.

But it is often difficult to use sulphur smoke to disinfect a dental office or laboratory; but the same re-agent may be used in a different form. At most drug stores a solution of sulphurous acid in water may be obtained by asking for liquid sulphurous acid. This can be applied to the spittoon, or other objects, by a sponge or a small watering pot. It may be diffused through the room by an atomizer.

But, if not obtainable at the drug store, this acid is readily prepared. The smoke of burning sulphur may be forced into water by a very simple contrivance till the water is saturated, if a concentrated solution is desired. But a better way is to put scraps of filings of copper into a glass retort, and pour over them a mixture of sulphuric acid and water. Let the nozzle of the retort be under water, in a suitable vessel, and the gas, which rises in bubbles in the retort, is dissolved in water within the vessel.

If now and then, when the dentist has finished his week's work, he would treat his office to a dose of this disinfectant, and then have it well ventilated at an early hour on Monday morning, we would not hear so much about the bad health of dentists. It would totally destroy the accumulated poisons from the lungs and skin of his patients and himself. Of course, he would remove water-colored ornaments or other things likely to be injured by bleaching.

THE NECESSITY FOR CHANGE.

We do not mean to encourage restlessness, and yet the dentist who is without change is without improvement. There is no unchangeable way of doing anything, though changes for the worse should be avoided as we would avoid disease. Retrograde change is social or moral, or business disease, yet to say there is no room for change for the better in whatever we do or believe, is to advertise ourselves self-conceited old fogies.

In morals, in science, and in practice, there must be improvement, and no betterment can be where there is no change. To have good habits of living, thinking and doing is praiseworthy; to stick so tenaciously to them as to be changeless is to live without progressing. Clothes which fitted us once are too small, if we have been growing; conceptions which in the past filled our ideal of perfection, have shrunk into childish playthings, if our intellect has been expanding.

If we have undergone those changes which vigorous thinking brings to the intellect, culture to the spirits, and skill to the fingers, every feature of our countenance, our whole appearance, our very being is transformed.

There must be this change or we shall sink into a rut; our associates will be leaving us behind; the world itself will go too fast for us. Whatever we were yesterday which was praiseworthy must be surpassed to-morrow. Wealth itself, if it takes from us the incentive for improvement, becomes a misfortune. Position, power, or any aggrandizement will be "vanity and vexation of spirit" if the whole man is not fitted for the situation.

As dentists, therefore, let us not be contented with what we are, but

be ever changing for something better. Holding fast to that which is good, let us seek constantly for what is above and beyond. Old methods, materials, instruments and notions which stand the test of ripening experience cannot be spared, but liberal conservatism will take the place of bigotry and unintelligent routine. New developments from a thousand sources require sharp eyes, keen preception and increasing skill.

COMPOUND ANÆSTHETIC.

Samuel Foulds, House-Surgeon Chesterfield and North Derbyshire Hospital, in
British Journal of Dental Science.

The many deaths from chloroform lead me to bring before you the compound anæsthetic which, for nearly five years, has been used in the Chesterfield and North Derbyshire Hospital with safety. It is a mixture of absolute alcohol, chloroform and ether, and is made as follows: One ounce of alcohol is added to two of chloroform, and these are shaken together; three ounces of ether is then added, and, after shaking again, it is ready for use. For administration, a leather cylinder, closed at one end—where it is freely perforated with holes, and shaped at the other to fit over the nose—answers perfectly well. This is lined with a loose flannel bag, in which a sponge is placed to hold the anæsthetic, and we usually commence with from two to four drachms.

This morning a boy, aged 15, was placed on the table for operation and an examination of the chest revealed aortic and mitral diseases of a well-marked character. It was deemed better to use ether alone in this case, under which the pulse at the wrist failed rather rapidly. We agreed to fall back on the compound anæsthetic, when the pulse immediately improved, and the operation was satisfactorily completed.

Quite recently a powerful man of fifty years was brought in with dislocation of the humerus into the axilla, which had happened five days previously. He had only applied for assistance on the previous day, to a surgeon who had had considerable experience in administering chloroform in a hospital where he had been house-surgeon. This gentleman wrote me a note stating he had twice tried chloroform on the patient, but that it produced such alarming symptoms he dared not continue it, and expressed the wish for me to use the compound anæsthetic. I accordingly used it, without the least approach to dangerous symptoms, and easily reduced the dislocation.

I have never seen a death from chloroform, but I can readily recall to my mind several cases in which it seemed imminent, and when the patients have only been restored with the greatest difficulty; but I have not once witnessed this under the compound anæsthetic.

CONTINUOUS GUM DENTURES.

The greatest difficulty and embarrassment that has attended the construction of continuous gum dentures, have been found in the operation and management of the furnace or furnaces employed.

To all who have experience in this matter, a bare mention is sufficient, and to those who have not such experience, any description that could be given here would fail to give an adequate impression.

The difficulties that attend the furnace work has been one of the great obstacles to its more general introduction and use.

The furnaces in common use, up to within a recent period, involved much tedious and difficult manipulation. From six to ten hours were required for the furnace work alone, for the production of a continuous gum piece, and from two to five bushels of coke or anthracite coal were required for an operation, and a workman of salamander quality to run the machine. But now how changed—there is some risk in stating the whole truth on this subject, lest one's reputation for veracity suffers. Dr. A. Tees' Lilliput furnace for continuous gum work has wrought a revolution, or at least a remarkable improvement.—*ED. Dental Register.*

DENTITION IN THE HORSE AND OTHER ANIMALS.

BY PROFESSOR WILLIAMS, OF EDINBURGH, IN "DENTAL RECORD," OF LONDON.

The Teeth of Some Animals.

A foal is born with two central incisors in each jaw, and a calf has eight incisors at birth, or a few days afterwards. A pig has four incisors at birth, or a few days after. When nine weeks old the horse has four incisors. There are no changes in the incisors of the horse till he is two and a-half years old, when the centrals shed; at three and a-half years the laterals, and at four and a-half years of age the horse is said to have a full mouth—40 teeth.

As regards the molars of the horse, there are at birth, or shortly afterwards, three temporary molars in each jaw. At the age of one year the first permanent molar is cut, and it stands fourth in the row. When the horse is two years old the second permanent molar is erupted, and stands fifth in the row. At three years, the two anterior temporary molars are replaced with permanent ones. The sixth molar is cut, and at the same time the remaining temporary molar, which stands third in the row, is replaced by a permanent one.

The dog has 42 teeth, and the arrangement is not quite so symmetrical.

In the camel there are only two canines and two incisors. It is a re-

markable arrangement that in the ruminating animals the incisors are in the lower jaw only.

A beautiful arrangement exists with reference to the ox's teeth. They are fitted in quite an elastic way, and not fixed. When the chisel-like teeth are made use of in the act of grazing, there is an elastic cushion which prevents fracture of the teeth. Notwithstanding the force with which the cow grazes in a field, and the liability of coming into contact with stones, it seldom happens that the teeth are broken, owing, no doubt, to the fact that they are on an elastic cushion.

HAVE CLEAR CONVICTIONS AND FOLLOW THEM.

In the line of his specialty the dentist is supposed to be the superior of his patient. If he is really qualified for his position he should assume this superiority, and not yield to the whims and the parsimony of his patients. In his decisions he must not fear nor cater to them. In his course of practice he must not dread their influence. While a haughty demeanor should be avoided, an intelligent dignity should be maintained; while extortion should be reprehended, professional services should be rated above a mere trade, and while he should not be too free in imparting professional knowledge, he should always be ready to give necessary information to those under his care.

NERVOUS FORCE.—Its Origin and Physiology, is a pamphlet from the pen of W. C. Barrett, M.D., D.D.S., Buffalo. We need not say it is original, for this is characteristic of the writings of Dr. Barrett. That we do not agree with him in all his conclusions is natural enough, because he does not stop to ask any one what he shall say, and he takes it for granted that his readers are thinkers. The Doctor is always instructive and interesting.

Dr. Frank Abbott has prepared a fine delineation of an incisor tooth. But his arrangements are such that we are not permitted to participate in its sale. In view of this, it does look a little "cheeky" for the firm the Doctor has entrusted with its sale to ask the editor of the *ITEMS* to advertise it editorially.

DR. J. A. ROBINSON, of Jackson, Mich., has brought out an improvement on Slayton's Felt-Foil. It is called fibrous and textile metallic filling. It would be well for dentists using tin foil, or objecting to amalgam, to look into its merits. It is also used for lining rubber or celluloid plates. Dr. Robinson is a dentist of prominence.